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INVESTIGATION OF PHYSICAL AND MENTAL FACTORS FOR QUALITY OF LIFE OF DIABETIC PATIENTS IN HEALTH FACILITIES

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ABSTRACT

The study aims to investigate the physical and mental factors that influence the quality of life of diabetic patients. It was a cross-sectional study involving respondents from Mayo Hospital (MH) in Lahore and Jinnah Hospital (JH) in Lahore. Data were collected using the standardized SF-12 questionnaire and analyzed with the Statistical Package for Social Sciences (SPSS). The student t-test and Chi-square test were employed to compare means and percentages, respectively, while a regression model assessed the factors affecting domain scores. A total of 370 diabetic patients participated, with 220 from MH and 150 from JH. The mean age was 61.3 ± 10.8 years at MH and 56.5 ± 12.4 years at JH. The mean fasting blood sugar levels were 170.6 ± 68.2 mg/dL at MH and 187.1 ± 68.5 mg/dL at JH. The Mental Component Summary scores were higher than the Physical Component Summary scores in both facilities. Respondents with fasting blood sugar levels below 130 mg/dL exhibited higher domain scores. Significant factors affecting the quality of life included age, family history, duration of diabetes mellitus, and fasting blood sugar levels. This study concludes that maintaining blood glucose levels below 130 mg/dL is associated with improved domain scores and, consequently, a better quality of life. It is recommended to raise awareness of various risk factors to enhance the quality of life for diabetic patients.

Keywords: Diabetes mellitus, Glucose, Blood, Quality of Life.

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INTRODUCTION

The concept of Quality of Life (QOL) has gained global recognition, particularly within the healthcare system. The definition of QOL can vary significantly based on the researcher's perspective—whether societal or individualistic—as well as the theoretical model employed and academic background. Some definitions focus on health, well-being, or functional capacity, while others prioritize satisfaction or success. The World Health Organization (WHO) defines quality of life as an individual's perception of their life concerning their objectives, expectations, standards, and concerns, all within the context of their cultural and value systems. Quality of life encompasses a broad range of factors, including

physical, mental, and social well-being, as well as comfort [1].

Diabetes mellitus (DM) is a chronic metabolic condition with a rising prevalence worldwide, particularly affecting middle- and low-income countries. This trend is attributed to various factors, including aging populations, urbanization, shifts in cultural and social perspectives, dietary changes, physical inactivity, evolving diagnostic criteria and screening practices, inadequate treatment facilities, and a high prevalence of overweight individuals [2-4]. Numerous studies have indicated that type 2 diabetes is linked to a diminished quality of life, impacting all aspects of health-related quality of life (HRQOL), which can lead to increased

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morbidity and reduced life expectancy.

Diabetic clinics provide a range of essential services, including diagnosis, treatment, patient care, referrals, follow-ups, and assessments for complications, all guided by clinical protocols. They also involve the collection and documentation of patient information in medical records [5, 6]. The ongoing demands of diabetes management—such as careful meal planning, regular exercise, frequent blood glucose monitoring, scheduling, and coping with the symptoms of fluctuating blood glucose levels—along with the anxiety surrounding potential complications, significantly influence quality of life.

Research consistently shows that individuals with diabetes mellitus experience a lower quality of life compared to healthy individuals, although the underlying reasons remain unclear. In Pakistan, various factors—such as the type of diabetes, insulin use, age, diabetes-related comorbidities, social status, psychological factors, ethnicity, education level, understanding of the condition, and the nature of support received—can affect QOL. Assessing QOL provides an objective evaluation of the disease's impact on various aspects of patients' well-being, making these evaluations crucial for monitoring quality of life and identifying areas needing improvement. Therefore, this study aimed to evaluate the quality of life of diabetic patients attending secondary and tertiary facilities in Punjab, along with associated factors [7, 8].

METHODS

Study setting

This study was conducted in Lahore, Punjab, Pakistan, from March 2020 to June 2021. Jinnah Hospital, a teaching hospital in the Pakistani province of Punjab, was founded in 1996 in Lahore and is named after Quaid-e-Azam Muhammad Ali Jinnah, the country's founder. It covers an area of 105 acres. It is now fully operational with 1500 beds after adding a new 100-bed Accident & Emergency Department in 2005. The unique needs of each patient and their family are our top priority at Jinnah Hospital Lahore. As one of Pakistan's top hospitals, we aspire to be the healthcare provider of choice and be recognized for offering our patients the best possible care, the best possible clinical outcomes, and the most skilled physicians, specialists, and staff. Serving people since 1871, Mayo Hospital is the biggest and oldest hospital in the nation. Completed in 1870, Mayo Hospital began providing medical care in 1871. Situated on more than 54.6 acres of land, it is a center of excellence for public benefit and one of the biggest hospitals in South East Asia. It can accommodate

up to 2399 beds. Mayo Hospital Lahore's mission is to provide safe, cutting-edge healthcare while cultivating hardworking medical professionals driven by compassion. It offers comprehensive interdepartmental contact in integrated medicine, where all employees strive toward the same objective of providing cutting-edge medical care without error [9].

Study Design

This cross-sectional study aimed to assess the quality of life of diabetic outpatients attending MH Lahore and JH Lahore in Punjab.

Study Population

The study focused on diabetic outpatients visiting Mayo Hospital Lahore and JH Lahore.

Determination of Sample Size

A simple random sampling method was employed to conveniently recruit 370 participants who consented to participate in the study [10].

Inclusion Criteria

Diabetic outpatients aged 18 years and older who consented to participate in the study were included.

Exclusion Criteria

Diabetic patients with complications, those under 18 years of age, pregnant women, and individuals with co-morbidities were excluded.

Data Collection Instrument

The validated United Kingdom SF-12 health survey, standardized for diverse populations, served as the data collection instrument. This three-page questionnaire assesses various aspects of health, including general well-being, daily activities, the impact of health on emotional well-being, and the interference of pain with physical health. The SF-12 was administered to patients previously enrolled in the study. Data were summarized into the Physical Composite Scale (PCS) and the Mental Composite Scale (MCS). Blood glucose levels were recorded as reported [11].

Data Analysis

The Physical Composite Summary (PCS) and Mental Component Summary (MCS) were scored using the Quality Metric SF-12 V 2 data quality evaluation program. The results ranged from 0 to 100, with higher scores denoting better physical and mental health. SPSS version 22.0 was used for data entry and analysis. Descriptive statistics were used to examine clinical and demographic features, and multiple regression analysis was used to find important predictors of quality of life. PCS and MCS score variations were evaluated using the Student's t-test, with $P < 0.05$ being regarded as statistically significant [12].

RESULTS

Socio-demographic and clinical characteristics of respondents

The respondents were selected from both facilities. The majority of respondents at JH, Lahore, were aged 21 to 30 years, while those at MH, Lahore, were primarily over 61 years.

Baseline Characteristics of the Respondents

The average fasting blood sugar (FBS) exceeded 170 mg/dL in both facilities, and most respondents

had a duration of diabetes mellitus (DM) of less than 5 years.

Distribution of SF-12 Domain Scores

There were no significant differences in domain scores between the health facilities ($p > 0.05$). However, significant differences were noted in physical functioning, role physical, and social functioning across the facilities.

Table 1: Baseline characteristics of the respondents

Variable		Health Facilities	
Sub-variable		MH, Lahore (N=220)	JH, Lahore (N=150)
FBS (mg/dL)	<130	26(21.7%)	33(27.5%)
	130-150	28(23.3%)	33(27.5%)
	151-170	8(6.7%)	6(5.0%)
	171-190	8(6.7%)	5(4.2%)
	>190	50(41.7%)	43(35.8%)

*FBS: Fasting Blood Sugar; MH: Mayo Hospital; JH: Jinnah Hospital

Table 2: Distribution of SF-12 domain scores.

SF-12 Component	MH, Lahore	JH, Lahore	p-value
Physical functioning	42.92±22.45	46.82±17.29	0.023
Role Physical	27.38±12.33	29.55±9.98	0.047
Role Emotional	29.54±7.07	29.09±9.21	0.073
Mental Health	69.69±43.13	78.18±15.00	0.063
Bodily Pain	30.92±11.79	32.27±11.10	0.127
General Health	24.46±10.09	30.45±7.85	0.180
Vitality	36.00±14.98	33.18±11.70	0.396
Social Functioning	33.23±9.68	36.36±7.27	0.019
Physical Component Summary	31.42±7.02	34.77±7.02	0.150
Mental Component Summary	42.15±16.08	44.20±19.79	0.343

*Significance level: $p < 0.05$; MH: Mayo Hospital; JH: Jinnah Hospital

Table 3: Association of domain scores with glycaemic control

SF-12 Component	<130mg/dL		>130mg/dL		P-value
	MH, Lahore	JH, Lahore	MH, Lahore	JH, Lahore	
Physical functioning	49.43±8.98	50.12±14.65	21.84±10.65	39.07 ± 8.30	0.626
Role Physical	48.60±4.11	35.54±10.54	20.83±12.30	27.89±11.25	0.832
Role Emotional	35.60±4.11	32.54±11.12	39.35±13.01	26.26±10.09	0.814
Mental Health	59.65±10.11	80.65±10.32	37.87±13.65	59.89±11.43	0.722
Bodily Pain	27.54±13.65	20.43±13.59	27.37±18.54	24.76±28.30	0.931
General Health	39.54±13.65	42.45±15.32	21.52±14.35	37.89±11.32	0.874
Vitality	38.43±10.61	43.87±12.05	42.84±8.54	34.98±10.21	0.809
Social Functioning	40.45±12.89	46.54±15.65	42.86±13.54	28.89±8.32	0.897
Physical Component Summary	41.28±8.83	37.14±10.94	21.52±8.31	32.40±6.19	0.041
Mental Component Summary	43.53±9.46	50.90±17.96	40.73±2.18	37.50±13.31	0.940

*Significance level: $p < 0.05$; MH: Mayo Hospital; JH: Jinnah Hospital

Association of Domain Scores with Glycaemic Control

The relationship between domain scores and glycaemic control was also examined. Respondents with fasting blood sugar levels below 130 mg/dL had higher domain scores, although differences between the health facilities were not significant.

Socio-demographic Factors affecting PCS and MCS Scores

The results revealed that age, family history, duration of DM, Family history, and fasting blood sugar significantly predict quality of life.

DISCUSSION

Diabetes mellitus (DM) significantly impacts the quality of life (QOL) of individuals by affecting their physical, psychological, and social well-being. The progressive nature of type 2 DM and the risk of developing chronic complications mean that most diabetic patients will require insulin therapy. Effective glycaemic control is essential for preventing long-term complications and improving overall QOL [13-16].

In this study, most type 2 diabetic patients were over 50 years old, with a diabetes duration of less than 5 years in MH, Lahore, and more than 11 years in JH, Lahore. Patients over the age of 50 are more likely to be diagnosed with diabetes. However, lifestyle modifications such as dietary changes and increased physical activity can enhance health-related quality of life. Research indicates that younger individuals generally report a higher QOL than older adults. Additionally, social support is a crucial factor influencing the QOL of diabetes patients; greater social support, often found among younger individuals, correlates with improved quality of life. Furthermore, diabetes patients who receive robust support from family and friends are more likely to adhere to dietary recommendations and engage in physical activities, resulting in reduced diabetes-related discomfort [17].

Diabetes should be viewed not merely as a disease but as one of several health issues that can affect the elderly. This study's findings indicate that diabetes patients exhibited low quality of life scores across all domains of the PCS and MCS, as measured by the SF-12 questionnaire, reinforcing previous research by Qionghua *et al.* Additionally, individuals with fasting blood sugar levels greater than 130 mg/dL reported lower QOL. The decline in health-related quality of life can be attributed to the impact of macrovascular and microvascular complications on patients' physical and mental

functioning. Factors such as age, BMI, and the presence of comorbidities significantly influence various aspects of quality of life. As diabetic symptoms worsen, health-related quality of life (HRQOL) tends to deteriorate. Notably, a cohort study using the SF-36 scale found that the reduction of hyperglycemia in 94 patients after treatment and glycaemic control was associated with improvements in HRQOL, particularly in physical and social functioning, consistent with the findings of our investigation [18-20].

Glycaemic management has emerged as a crucial metric for reducing long-term complications and enhancing the quality of life for diabetic patients. Research indicates that glycaemic control significantly influences the quality of life (QoL) among individuals with diabetes mellitus (DM). Additionally, this study revealed that factors such as age, family history, and the duration of diabetes, along with fasting blood sugar levels, affect patients' quality of life. Previous research also indicated that lower scores in specific domains were correlated with longer diabetes duration, family history, and potentially inadequate adherence to medical advice regarding therapeutic management.

Limitations of Study

This study's small sample size limits the generalizability of the results to larger populations. Although conducted in two prominent health facilities in Punjab, the findings may not accurately reflect conditions in other settings [21, 22].

CONCLUSION

This study demonstrates that enhancing the quality of life for diabetic patients necessitates better blood glucose control. However, the quality-of-life scores in this population were low and closely tied to fasting blood sugar levels. Consequently, improving glycaemic control is likely to lead to a proportional improvement in patients' quality of life.

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